

21. (Amended) The interdigitated capacitor as recited in Claim 15 wherein the metal is copper.

### **REMARKS/ARGUMENTS**

The Applicants have carefully considered this application in connection with the Examiner's Action and respectfully request reconsideration of this application in view of the foregoing amendment and the following remarks.

The Applicants originally submitted Claims 1-20 in the application. Pursuant to a restriction requirement, Claims 1-14 were previously canceled without prejudice or disclaimer. The Applicants presently amend Claim 21 merely to correct an inadvertent error and without adding any subject matter to the claims, such that the amendment does not necessitate an additional search by the Examiner. The Applicants do not presently amend, cancel or add any other claims. Accordingly, Claims 15-22 remain pending in the application.

#### **I. Rejection of Claim 21 under 35 U.S.C. §112**

The Examiner has rejected Claim 21 under 35 U.S.C. §112, first paragraph, as containing subject matter which was not adequately described in the specification. In response, the Applicants have amended Claim 21 to correct this inadvertent error and appreciate the Examiner's diligence in finding and bringing this error to the Applicants' attention. The Applicants therefore respectfully request the Examiner withdraw the rejection.

## II. Rejection of Claims 15-21 U.S.C. §103

The Examiner has rejected Claims 15-21 under 35 U.S.C. §103(a) as being unpatentable under U.S. Patent No. 5,393,373 to Jun, *et al.* ("Jun") in view of U.S. Patent No. 6,436,787 to Shih, *et al.* ("Shih"). The Examiner has also asserted that the Applicants' arguments provided in the previous "AMENDMENT UNDER 37 C.F.R. § 1.111" are moot in view of the new ground(s) of rejection. However, the Applicants respectfully disagree.

As discussed in the previous "AMENDMENT," Jun fails to teach first electrodes and a first conductive layer both comprising a metal. Jun also fails to suggest first electrodes and a first conductive layer both comprising a metal. More specifically, one skilled in the art would not be motivated to arrive at the present invention given the teachings of Jun because Jun only teaches that doped polysilicon protrusions 26 may be formed on a doped polysilicon layer 24 (column 7, lines 2-21; FIGs. 8a-8d), and there is no indication, motivation or even a mention that the doped polysilicon may be replaced with metal as recited in Claim 15.

Jun also fails to suggest an electrode layer comprising the metal. In contrast, Jun only teaches that the plate polysilicon layer (17) comprises doped polysilicon (as discussed above), and again provides no indication, motivation or even a suggestion that doped polysilicon can advantageously be replaced with or comprise a metal.

Moreover, the device taught in Jun is at the device level of an integrated circuit. As such, one skilled in the art would not be motivated to replace the polysilicon in Jun with metal due to the large thermal budget present in front-end processing used at the device level. More specifically, those skilled in the art understand that polysilicon is typically used instead of metal during front-end processing at the device level because polysilicon has a significantly higher

melting point compared to metals like copper and, therefore, is less susceptible to the high temperatures required of front-end processing.

Accordingly, Jun fails to support a *prima facie* case of obviousness because one skilled in the art can find no suggestion or motivation to replace the polysilicon electrodes described therein with metal electrodes as recited in Claim 15 of the present application.

Moreover, Shih adds nothing to Jun, because Shih fails to teach or suggest an interdigitated capacitor. In contrast, Shih merely teaches a capacitor having a conventional barrel-shape. Furthermore, as discussed above, one skilled in the art would not be motivated to replace the doped polysilicon of Jun's device-level electrodes (24, 26, 17) with the copper of Shih's capacitor plates (24, 34) in view of the large thermal budget present in front-end processing used at the device level.

Accordingly, the combination of Jun and Shih fails to teach or suggest the invention recited in independent Claim 15 and its dependent claims. Therefore, the combination fails to support a *prima facie* case of obviousness of Claim 15 and its dependent Claims 16-21. Claims 16-21 are therefore not obvious in view of the combination of Jun and Shih.

In view of the foregoing remarks, the combination of Jun and Shih does not support the Examiner's rejection of Claims 15-21 under 35 U.S.C. §103(a). The Applicants therefore respectfully request the Examiner withdraw the rejection.

### III. Rejection of Claim 22 U.S.C. §103

The Examiner has rejected Claim 22 under 35 U.S.C. §103(a) as being unpatentable under Jun and Shih and further in view of U.S. Patent No. 6,150,706 to Thakur, *et al.* ("Thakur").

However, as discussed above, the combination of Jun and Shih fails to support a *prima facie* case of obviousness of Claim 15 and its dependent claims. Moreover, Thakur adds nothing to the combination because Thakur also fails to teach or suggest first electrodes, a first conductive layer and an electrode layer all comprising a metal. In contrast, Thakur merely discloses a conventional capacitor wherein only one of the electrodes (16) is formed from a barrier material. (Column 3, lines 1-8). Moreover, Thakur only discloses that the other electrode (12) is formed from a conductive material, such as polysilicon, and fails to provide any indication, motivation or even a suggestion that the polysilicon electrode (12) may be replaced with or comprise a metal. Furthermore, as discussed above, one skilled in the art would not be motivated to replace the doped polysilicon of Jun's device-level electrodes (24, 26, 17) with the barrier material of Thakur's conductive barrier layer electrode (16) in view of the large thermal budget present in front-end processing used at the device level and the significantly lower melting point of metal compared to polysilicon.

Accordingly, the combination of Jun, Shih and Thakur fails to teach or suggest the invention recited in independent Claim 15 and its dependent claims. Therefore, the combination fails to support a *prima facie* case of obviousness of Claim 15 and its dependent Claim 22. Claim 22 is therefore not obvious in view of the combination of Jun, Shih and Thakur.

In view of the foregoing remarks, the combination of Jun, Shih and Thakur does not support the Examiner's rejection of Claim 22 under 35 U.S.C. §103(a). The Applicants therefore respectfully request the Examiner withdraw the rejection.

#### IV. Conclusion

In view of the foregoing amendment and remarks, the Applicants now see all of the Claims currently pending in this application to be in condition for allowance and therefore earnestly solicit a Notice of Allowance for Claims 15-22.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

The Applicants request the Examiner to telephone the undersigned attorney of record at (972) 480-8800 if such would further or expedite the prosecution of the present application.

Respectfully submitted,

HITT GAINES & BOISBRUN, P.C.



Charles W. Gaines  
Registration No. 36,804

Dated: 1/28/03

P.O. Box 832570  
Richardson, Texas 75083  
(972) 480-8800

**FAX RECEIVED**

JAN 28 2003

TECHNOLOGY CENTER 2800

ATTORNEY DOCKET NO.: JONES 2-21-60

PATENT

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

(1) Please amend Claim 21 as follows:

21. (Amended) The interdigitated capacitor as recited in Claim 15 wherein the metal is copper [or a copper alloy].